REMARKS

Claims 1 to 34 are all the claims pending in the application, prior to the present Amendment.

Claims 7 and 11 have been rejected under the second paragraph of 35 U.S.C. § 112 as indefinite.

The Examiner states that claims 7 and 11 contain the phrase "a 5 micron square region arbitrarily selected from a transmission electron microscope bright field image of a cross-section surface obtained by cutting the particle into flake form."

The Examiner states that the term "arbitrarily" renders the claim indefinite because it is unclear whether the recitations following the phrase are part of the claimed invention.

Applicants disagree with this rejection.

The Examiner does not provide any reason why the Examiner considers that it is unclear whether the recitations following the phrase "arbitrarily" are part of the claimed invention of claims 7 and 11. The recitations following the phrase recite a property of the carbonaceous particles of claims 7 and 11 under specified conditions. One of ordinary skill in the art reading this phrase would have no reason to believe that the recitations are not part of the claimed invention of claims 7 and 11.

The recitation "arbitrarily selected from" in claims 7 and 11 means a 5 micron square region freely selected from a transmission electron microscope image of a cross-section surface obtained by cutting the carbonaceous particle.

Claims 7 and 11 recite the particles in plural: i.e. " a cross-section surface obtained by cutting the carbonaceous particles into flake form." Applicants note that a 5 micron square region is provided on a cross-section surface of one particle. Additionally, the region other than the cross-section of the particle (for example, a binder resin region) is not included in the above square region.

In order to further clarify claims 7 and 11, applicants have amended claims 5 and 7 by replacing the term "arbitrarily" with the term -- randomly--.

In view of the above, applicants request withdrawal of this rejection.

Claims 1-11, 21, 22 and 28-33 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent 6,723,471 to Kitagawa et al.

Applicants note that although the Examiner states that the rejection is based on U.S. Patent 6,723,471 to Kitagawa et al, the Examiner has not cited U.S. Patent 6,723,471 on the Notice of References Cited Form PTO-892. Further, throughout the Office Action, the Examiner refers to particular portions of Kitagawa et al by reference to paragraph numbers. The '471 patent to Kitagawa et al does not contain paragraph numbers. Applicants note that the corresponding U.S. Patent Application Publication 2002/0061445 to Kitagawa et al, which the Examiner does cite on the Form PTO-892, does contain paragraph numbers.

Applicants submit that Kitagawa et al do not disclose or render obvious the subject matter of the present invention and, accordingly, request withdrawal of this rejection.

The present invention as set forth in claim 1 as amended above is directed to a carbon material for a battery electrode, which comprises a carbon powder material as a composite of

carbonaceous particles and an a carbon material derived from an organic compound prepared by allowing the organic compound serving as a polymer source material to deposit onto and/or permeate into the carbonaceous particles to thereby polymerize the polymer material and then heating at 1,800 to 3,300°C, and which has an intensity ratio of 0.1 or more for peak intensity attributed to a (110) plane to peak intensity attributed to a (004) plane determined through X-ray diffraction spectroscopic analysis on a sheet obtained by press-molding a mixture of the carbon material and a binder resin when pressed at 10^3 kg/cm^2 or higher. The carbonaceous particles are composed of high-crystallinity natural graphite which has the C_0 value of a (002) plane as determined through X-ray diffraction spectroscopy of 0.6703 to 0.6800 nm, La (crystallite size in the a-axis direction) of greater than 100 nm (La > 100 nm) and Lc (crystallite size in the c-axis direction) of greater than 100 nm (Lc > 100 nm).

Thus, applicants have amended claim 1 to incorporate the recitations of claim 3. Applicants have canceled claim 3. Further, applicants have amended claim 1 to recite that the X-ray diffraction analysis is on a sheet obtained by press-molding a mixture of the carbon material and a binder resin, when pressed at 10^3 kg/cm^2 or higher.

The measuring object is completely different in Kitagawa et al and the present invention. In the present invention, X-ray diffraction (XRD) ratio measurement is carried out on a molded product prepared by applying, drying and pressing a mixture of a carbon material for a negative electrode subjected to surface treatment (product of the invention) and a binder on a collector, as described in the specification beginning at page 32, line 26. On the other hand, Kitagawa et al carry out the XRD ratio measurement on pellets formed by pressing the graphite powder as a nucleus before forming a carbonaceous layer on the surface of the nucleus, as described in the

section of the Kitagawa et al specification having the heading "(7) Measurement of X-ray Peak Intensity Ratio of (110)/(004)," at column 9 of Kitagawa et al '471.

The XRD ratio changes due to the surface treatment. By performing the surface treatment in the present invention, the particles become harder and less likely to be crushed and the crystals become less likely to be oriented. The battery properties largely depend on the status of the electrode completed by press-molding. The present invention is based on the finding that the orientation degree of the crystals in the electrode completed by press-molding affects the battery characteristics and defines the electrode having good properties by the XRD ratio.

To further distinguish the present invention from Kitagawa et al, applicants have amended claim 1 by replacing "X-ray diffraction spectroscopy analysis on" with "X-ray diffraction spectroscopy analysis on a sheet obtained by press-molding…".

Applicants submit that the materials of Kitagawa et al do not satisfy or render obvious the recitations of the present claims.

The Examiner states that Kitagawa et al disclose in paragraph [0018] an x-ray diffraction ratio of (110)/(004) of 0.015 or more.

The Examiner states that this corresponds to an intensity peak of 0.1 or more for peak intensity attributed to a (110) plane to peak intensity attributed to a (004) plane determined through x-ray diffraction.

In response, and as discussed above, applicants point out that the measurement object is different in Kitagawa et al and the present invention. Since it is highly likely that the hardness of the entire particles increases by coating the surface of the particles, the XRD ratio is different in the nucleus particles and the surface-coated particles.

Kitagawa et al provide examples of their XRD in Table 1. The ratios in Table 1 of Kitagawa et al are for the graphite core particles, and not for the carbon material comprised of the graphite core particles and carbon surface layer. Invention Samples 1 to 15 of Table 1 of Kitagawa et al have XRD ratios that are below that of claim 1. Sample 16 of Kitagawa et al shows a (110)/(004) ratio of 0.120 in Table 1. However, Sample 16 is a comparative example of Kitagawa et al in which spherical graphite is used as the graphite material. To further distinguish the present invention from the comparative Sample 16 of Kitagawa et al, applicants have amended claim 1 to recite the subject matter of claim 3. Applicants have canceled claim 3.

Although Sample 16 of Kitagawa et al has a (110)/(004) ratio of 0.1201, it has an Lc value of 700 A (i.e. 70 nm), while the carbonaceous particle of the present invention has an Lc value of greater than 100 nm and, thus, the two are different from each other. The higher the Lc value, the higher the degree of graphitization, which enables higher discharge capacity as a result.

With respect to the recitations of claims 7 and 11, the Examiner states that in view of the disclosures in Paragraphs [0022] to [0027] of Kitagawa et al, the graphite carbon disclosed in Kitagawa et al would posses the recitations of claims 7 and 11.

In response, applicants point out that in Kitagawa et al, the crystallinity is lower in the surface coating layer than in the nuclei particles. That is, only the surface layer of the particles has a low crystallinity in Kitagawa et al. Meanwhile, in the present invention as defined in claims 7 and 11, not only the surface layer of the particles contains a low crystallinity portion, but the core part of the particles also contains both low crystallinity and high crystallinity portions (observed by TEM).

Particularly, claims 7 and 11 explicitly define that a 5 micron square region randomly selected from a cross-section surface of a carbonaceous particle include both a crystalline region, that is, a region including a diffraction pattern having only one spot attributed to a (002) plane), and an amorphous region, (that is, a region including two or more spots attributed to a (002) plane), which particle is different from that of Kitagawa et al.

In view of the above, applicants submit that Kitagawa et al do not disclose or render obvious the subject matter of the present invention and, accordingly, request withdrawal of this rejection.

Claim 12 has been rejected under 35 U.S.C. § 103(a) as obvious over US patent 6,723,471 to Kitagawa et al in view of Yin et al.

Since claim 12 depends from claim 1, which possesses unobviousness for the reasons discussed above, applicants submit that the subject matter of claim 12 is not rendered obvious by Kitagawa et al and Yin et al.

In view of the above, applicants request withdrawal of this rejection.

Claims 13-20 have been rejected under 35 U.S.C. § 103(a) as obvious over U.S. Patent 6,723,471 to Kitagawa et al in view of U.S. Publication No. 2003/0044603 to Morita et al.

The Examiner states that Kitagawa et al do not disclose the use of carbon fibers. The Examiner relies on Morita et al for a teaching of the use of carbon fibers in a battery electrode, including a lithium ion secondary battery. The Examiner argues that it would have been obvious to employ carbon fiber in Kitagawa et al in view of the teachings of Morita et al.

Since claim 13 depends from claim 1, which possesses unobviousness for the reasons discussed above, applicants submit that the subject matter of claim 13 is not rendered obvious by Kitagawa et al and Morita et al.

Further, Morita et al only describe a fine carbon fiber composition comprising a fine carbon fiber as an electrode material and neither disclose nor suggest the carbon material for an electrode of the present claim 13, which is characterized in that at least portion of the carbon fiber is deposited on a surface of the carbon powder material.

In view of the above, applicants submit that Kitagawa et al and Morita et al do not disclose or render obvious the subject matter of claim 13 and, accordingly, request withdrawal of this rejection.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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Respectfully submitted,

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